IN THE CLAIMS

1.   (Original) A decoder, comprising:

a constellation mapper circuit to determine two constellation points that are proximate a received symbol;

an index mapper circuit to determine a constellation index corresponding to the received symbol based on the received symbol and the two constellation points that are proximate the received symbol; and

a coset selector circuit to receive successive constellation indices from the index mapper and to determine a number of nearest cosets to the successive constellation indices.

2.   (Original) The decoder of claim 1, wherein the two constellation points are the nearest two points to the received symbol in a predetermined constellation of points.

3.   (Original) The decoder of claim 2, wherein one of the two constellation points is less than or equal to the received symbol and another of the two constellation points is greater than or equal to the received symbol.

4.   (Original) The decoder of claim 1, wherein the index mapper circuit is arranged to determine two constellation indices that correspond to the two constellation points and to determine the constellation index corresponding to the received symbol based on the two constellation indices that correspond to the two constellation points

5.   (Original) The decoder of claim 4, wherein the index mapper circuit is arranged to interpolate between the two constellation indices that correspond to the two constellation points based on the received symbol.

6.   (Original) The decoder of claim 1, further comprising:

combiners to generate at least one difference between the received symbol and at least one of the two constellation points that are proximate the received symbol,

2

wherein the index mapper circuit further determines the constellation index corresponding to the received symbol based on the at least one difference.

7.   (Original) The decoder of claim 1, wherein the coset selector circuit is arranged to determine about four or more nearest cosets to the successive constellation indices.

8.   (Original) The decoder of claim 1, further comprising:

a sequence estimator circuit connected to the index mapper circuit and the coset selector circuit and arranged to generate a sequence of trellis points based on the nearest cosets and one or more constellation indices corresponding to received symbols.

9.   (Original) The decoder of claim 8, further comprising:

an equivalence class index mapper circuit to generate equivalence class indices from the sequence of trellis points; and

an inverse modulus encoder circuit connected to the equivalence class index mapper and arranged to generate data bits from the equivalence class indices.

10.   (Currently Amended) A method of decoding data, comprising:

determining two constellation points that are nearest a received symbol;

combining the received symbol and at least one of the two constellation points to produce at least one difference value; and

identifying a constellation index corresponding to the received symbol based on the two constellation points and the at least one difference value; and

determining at least four nearest cosets to successive constellation indices.

11.   (Original) The method of claim 10, wherein the identifying includes:

determining two constellation indices that correspond to the two constellation points; and

interpolating between the two constellation indices based on the at least one difference value to identify the constellation index corresponding to the received symbol.

3

12.   (Canceled)

13.   (Currently Amended) The method of claim [[12]] 10, further comprising:

calculating a scale value based on the two constellation points; and

generating a sequence of points based on the at least four nearest cosets, the scale value, and constellation indices corresponding to received symbols.

14.   (Original) The method of claim 13, further comprising:

generating equivalence class indices from the sequence of points; and

producing data bits from the equivalence class indices.

15.   (Currently Amended) A machine-accessible medium including instructions for execution by a machine, comprising:

instructions for determining two constellation points that are nearest a received symbol, one constellation point of the two being greater than or equal to the received symbol and another constellation point of the two being less than or equal to the received symbol;

instructions for identifying two constellation indices that correspond to the two constellation points; and

instructions for interpolating between the two constellation indices to produce a constellation index corresponding to the received symbol; and

instructions for determining a number of nearest cosets to a pair of successive constellation indices corresponding to received symbols.

16.   (Original) The medium of claim 15, further comprising:

instructions for combining the received symbol and the two constellation points to produce difference values,

wherein the instructions for interpolating use the difference values to produce the constellation index.

17.   (Canceled)

4

18.   (Currently Amended) The medium of claim [[17]] 15, further comprising:

instructions for generating a sequence of points based on the number of nearest cosets and constellation indices corresponding to received symbols.

19.   (Original) The medium of claim 18, further comprising:

instructions for converting the sequence of points to equivalence class indices; and

instructions for decoding the equivalence class indices to generate data bits.

20.   (Currently Amended) A system, comprising:

a constellation mapper arranged to receive a symbol and to determine two constellation points that are proximate the received symbol, and

an index mapper arranged to determine a constellation index corresponding to the received symbol based on the received symbol and the two constellation points that are proximate the received symbol; and

a hard disk proximate the constellation mapper; and

a coset selector to receive successive constellation indices from the index mapper and to determine a number of nearest cosets to the successive constellation indices.

21.   (Canceled)